

REMARKS:

- 1) In accordance with the PCT procedures, the original specification of this application was a direct literal English translation of the foreign language text of the corresponding PCT International Application. The specification has now been amended in an editorial and formal manner to better meet US application form requirements (e.g. added section headings, avoiding claim number references in the description, etc.). These editorial amendments do not introduce any new matter. Entry thereof is respectfully requested.

- 2) Further according to the PCT procedures, the original claims 25 to 39 of this application were based on a direct English translation of the revised foreign language PCT claims that had been submitted for the PCT International Application on August 31, 2005. Those directly translated claims have now been canceled. New claims 40 to 61 have been drafted "from the ground up" as a fresh approach at covering inventive subject matter, with a somewhat different claim terminology, style and format, in view of typical US claim practice, in comparison to the directly translated PCT claims. The revisions relative to the original claims are to avoid stylistic aspects of the directly translated PCT claims that are not desired for US claim practice. Furthermore, additional features of the invention have been introduced in certain claims, to cover additional inventive subject matter. The new claims are supported by the original claims and the original disclosure as shown in the following

4938/WFF:he

- 11 -

table, and do not introduce any new matter. Entry and consideration of the new claims are respectfully requested.

new claims	40	41	42	43	44	45	46	47	48
original support	cl 25; p 611-23	cl 26	p 6 110-12	cl 27	p 6 110-12	p 6110-12	cl 29	cl 28	cl 25, 30

new claims	49	50	51	52	53	54	55
original support	cl 30	cl 31	p 3 13-6, 12-15; p 4121- p 512; p 5119-21; p 7113-19	p 3 13-6, 12-15; p 4121- p 512; p 5119-21; p 7113-19	p 3 13-6, 12-15; p 4121- p 512; p 5119-21; p 7113-19	p 313-11; p 5121-23	cl 25, 27 p 313-15; p 4121-p 512; p 5121-23; p 6110-12; p 7113-19

new claims	56	57	58	59	60	61
original support	cl 37; p 611-23	cl 37	cl 27	p 313-6, 12-15; p 4121-p 512; p 5119-21; p 7113-19	p 7118-22	p 313-11; p 5121-23

- 3) Referring to section 1 on page 2 of the Office Action, the specification has been editorially and formally amended to better comply with US requirements, as mentioned above. Accordingly, please withdraw the objection to the disclosure.
- 4) Referring to sections 3 to 11 on pages 2 and 3 of the Office Action, the rejection of claims 25 to 39 as indefinite under 35 USC §112(2) has been addressed when preparing the new claims 40 to 61, to replace the prior claims 25 to 39. The new claims avoid unclear and indefinite terminology and reference numbers. It is respectfully submitted that the new claims definitely and particularly point out and distinctly claim the subject matter regarded as the invention. Please withdraw the rejection under 35 USC §112(2).

4938/WFF:he

- 12 -

- 5) Referring to section 15 on page 4 of the Office Action, the rejection of claims 25 to 39 as anticipated by EP 1 094 131 (Rickerby et al.) is respectfully traversed.

This rejection will be discussed in connection with the new claims 40 to 61, as the prior claims 25 to 39 have been canceled.

Rickerby et al. disclose a corrosion protective coating on a metallic article and method of producing the same. The metallic article has a nickel-based substrate composition containing more than 4.5 weight percent of aluminum. The protective coating 22 comprises a platinum enriched layer 24 on the surface of the metallic article 10, and a thin oxide layer 26 on the platinum enriched layer 24 (see paragraph 0036). The metallic article substrate includes a gamma prime phase 32 in a gamma phase matrix 30, and a layer 38 without any gamma prime phase, below the platinum enriched layer 24, which comprises a platinum enriched gamma prime phase 36 in a platinum enriched gamma phase matrix 34 (see paragraph 0041 and Figure 3). The coating 22 is produced by depositing a platinum layer on the metallic article, for example by electroplating, CVD, or PVD, followed by heat treatment so as to diffuse the platinum into the metallic article (see paragraphs 0037 to 0040). Of the overall protective coating 22 (including the platinum enriched layer 24 and the oxide layer 26), the platinum enriched layer 24 includes an outer zone with 45 weight percent platinum, an intermediate zone with 30 to 45 weight percent platinum, and an inner zone with 10 to 25 weight percent platinum (see paragraph 0045). It

is further preferred to add silicon, aluminum and chromium into the platinum enriched layer (see paragraph 0029).

The Examiner has interpreted this reference in a manner that "if each of these three zones is of approximately the same thickness (see Figure 3), a maximum mean value of $(45 + 45 + 25)/3 = 40$ wt.% of platinum is obtained". However, that interpretation is respectfully traversed, as being unsupported by the true disclosure of the reference. Figure 3 of the reference does NOT show the relative thicknesses of the outer zone, intermediate zone, and inner zone of the platinum enriched layer 24, but rather only shows the oxide layer 26, the platinum enriched layer 24, the substrate layer 38 devoid of gamma prime phase, and the underlying base portion 30 of the substrate. Fig. 3 does not show the three zones in the layer 24. Thus, the reference does not provide any relative depths or thicknesses of the three zones of the platinum enriched layer 24, so that there is no basis for the Examiner's proposed interpretation.

Furthermore, the main point of Rickerby et al. is to form platinum-enriched gamma and gamma prime phases dispersed in the substrate surface region, in a controlled or targeted manner. In order to achieve dispersion of such gamma and gamma prime phases, higher platinum amounts or concentrations are necessary. Thus, a person of ordinary skill in the art considering the Rickerby et al. disclosure, would further consider that the platinum concentration must be high enough to achieve the intended goal of forming and dispersing platinum-enriched gamma

and gamma prime phases. That would tend to require the higher concentrations as shown by the 45% concentration in the outer zone of the layer disclosed by Rickerby et al.

In comparison to the disclosure of Rickerby et al., the present new independent claim 40 recites that a surface region of the metallic article has a content of diffused-in platinum such that an integrated proportion of the platinum over an integration depth range is from 5 to 40 weight percent of an overall composition of the integration depth range, which extends from a minimum integration depth of from 0 to 5 μm into the substrate from the substrate surface, to a maximum integration depth at which a local content percentage of the platinum progressing from the substrate surface has diminished to 5 weight percent. Thus, new independent claim 40 defines a specific depth range over which an integration of the platinum content is to be performed, so as to determine the integrated proportion of platinum content, which is from 5 to 40 weight percent of the overall composition of this integration depth range. As discussed above, Rickerby et al. do not disclose relative depths or thicknesses of the three zones of the platinum enriched layer, and the Examiner's unsupported assumption in this regard is respectfully traversed. If, for example, the "outer zone" with 45 weight percent platinum is significantly thicker than the intermediate zone and the inner zone, then the integrated proportional content of platinum throughout the platinum enriched layer down to a depth at which the platinum content diminishes to 5 weight percent, would be above 40 weight percent and approaching 45 weight percent. Thus, the features of present

4938/WFP:he

- 15 -

claim 40 are not disclosed by Rickerby, so that claim 40 is not anticipated.

Claim 41 recites a lower integrated proportional content of platinum from 5 to 30 weight percent in the integration depth range of the surface region, and claim 43 limits the integrated proportional content of platinum to a maximum of 17.99 weight percent. These lower limited platinum contents are even further from the disclosure of Rickerby in which the outer zone of the platinum enriched layer has 45 weight percent platinum, the intermediate zone has 30 to 45 weight percent platinum, and only an inner zone has 10 to 25 weight percent platinum. Thus, claims 41 and 43 are not anticipated.

Claims 42, 44 and 45 make clear that the integration depth range begins directly at the surface of the substrate, namely with a minimum integration depth of 0 μm . This makes sure that the highest local content area of platinum, e.g. the outer zone according to Rickerby et al., is included in the integration. This further clarifies and accentuates the distinction between the present invention and Rickerby.

According to present claim 47, a proportion of the aluminum relative to the nickel or nickel alloy in the surface region corresponds to a proportion of the aluminum relative to the nickel or nickel alloy in the overall substrate composition. For example, this means that no additional aluminum has been diffused or otherwise introduced into the surface region. In contrast, Rickerby et al. disclose that additional aluminum can be introduced with or to the platinum enriched layer (see paragraph 0029).

Present claim 51 recites that the protective layer is formed by diffusion of exclusively at least one platinum group element including the above mentioned platinum. Claim 52 more narrowly recites that the protective layer is formed by diffusion of exclusively the above mentioned platinum. These claims are directly contrary to the teachings of Rickerby, whereby additional elements such as silicon, aluminum or chromium can be introduced into the surface region.

According to present claim 53, the protective layer consists exclusively of the nickel-based substrate composition and the platinum. Present claim 54 further recites that the metallic article expressly does not include an aluminized or alitized surface layer. These claims are directly contrary to the teachings of Rickerby et al. regarding the formation of an aluminized oxide layer 26 (e.g. see Fig. 3). It is important for Rickerby et al. to produce such an aluminum oxide layer as a barrier to reduce the oxidation or sulphatization at the surface of the metallic article (see paragraph 0061, 0062).

New independent claim 55 recites that the surface region of the nickel-based substrate has an averaged content of diffused-in platinum from 5 to 17.99 weight percent of an overall composition of this surface region, which extends from the substrate surface to a depth at which a local concentration of the platinum has diminished to 5 weight percent. Thus, the integration or averaging depth range of the surface region for defining the platinum content is clearly specified in claim 55. The maximum 17.99 weight percent content of platinum is significantly lower than the platinum content disclosed by Rickerby in an outer zone

with 45 weight percent platinum, an intermediate zone with 30 to 45 weight percent platinum, and an inner zone with 10 to 25 weight percent platinum. Also, the overall composition of the surface region in present claim 55 consists of the substrate composition plus the platinum. This makes clear that no additional elements other than the platinum have been introduced into the surface region. Rickerby discloses various other compositional elements preferably introduced into the protective layer surface region, beyond the compositional components of the substrate composition itself and the platinum. For these reasons, claim 55 is not anticipated by Rickerby et al.

New independent claim 56 is directed to a method of producing a metallic article having a protective layer at a substrate surface of a metallic substrate. This method includes a step of diffusing platinum into the substrate surface so as to form the protective layer as a surface region in the substrate extending from the substrate surface to a depth at which a local content percentage of the platinum has diminished to 5 weight percent. This surface region has an integrated proportional content of platinum from 5 to 40 weight percent of an overall composition of this surface region. As discussed above, Rickerby does not disclose such a platinum content in the surface region as presently defined. Thus, claim 56 is not anticipated.

Dependent claim 57 limits the platinum content to an upper limit of 30 weight percent, and dependent claim 58 limits the platinum content to an upper limit of 17.99 weight percent. As discussed above, these lower limits on the platinum content are

even further distinguished from the disclosure of Rickerby et al. regarding a significantly higher content of platinum.

Dependent claim 59 recites that the diffusing step consists of diffusing exclusively platinum into the substrate surface so as to form the protective layer as the surface region. This claim makes clear that no other elements are diffused into the surface region for forming the protective layer.

According to claim 60, the diffusing step comprises applying a platinum crossing material onto the substrate surface and then age hardening the metallic substrate with the platinum crossing material thereon, so that the platinum diffuses from the crossing material through the substrate surface into the surface region of the substrate. Such a step is not disclosed by Rickerby et al. Instead, the reference discloses applying a platinum layer by electroplating, CVD or PVD, followed by a high temperature diffusion heat treatment. As discussed above, that results in a much higher concentration of diffused-in platinum.

Claim 61 makes clear that the method according to the invention expressly excludes any aluminizing or alitizing step. That is contrary to the teachings of Rickerby et al. to provide an aluminum or alumina coating on the surface of the platinum enriched layer.

For the above reasons, Rickerby et al. do not disclose the features as recited in the present new claims 40 to 61, so that these claims are not anticipated. The Examiner is respectfully requested to withdraw the anticipation rejection applying Rickerby et al.

- 6) Referring to section 18 on pages 5 and 6 of the Office Action, the rejection of claims 25 to 39 as obvious over Rickerby et al. is respectfully traversed in connection with the new claims 40 to 61.

The claims have been discussed above in comparison to the disclosures of the reference.

The Examiner has stated "*certain values of average amounts of platinum in these ranges of Rickerby, such as 10, 25, and 30 wt. % platinum and other intermediate amounts for the various zones, are encompassed by the claimed integrated amounts when the integration is performed over individual zones*" (page 6 of Office Action). That assertion no longer applies to the new claims, in which the integration range for performing the integration for the platinum content has been defined, and does not read on, for example, only the intermediate zone or only the inner zone of the platinum enriched layer according to Rickerby.

Furthermore, the reason for the diminishing platinum content in the inwardly successive zones of the platinum enriched layer is due to the formation of this layer by diffusion from a platinum layer deposited on the substrate surface, with a subsequent diffusion heat treatment step. Thus, it would not have been possible to simply "select" to use the inner zone platinum content for the entire platinum enriched layer, because that could not be achieved by the disclosed heat treatment diffusion process which necessarily forms a high platinum content near the surface and a diminishing platinum content as depth increases. Also, the outer zone with the high 45 weight percent

platinum content is presumably necessary for achieving the intended corrosion resistance, because it is the outermost zone or portion of the platinum enriched layer that is subjected to the corrosive attack from the external environment (see paragraphs 0050 to 0057).

Thus, it would not have been obvious to modify the processing technique disclosed by Rickerby et al. in such a manner so as to modify the platinum composition so as to fall within or suggest the presently claimed protective layer composition with a significantly lower integrated percentage of platinum. As a result of the inventive production method, the inventive product has a lower amount of platinum, which achieves very good oxidation and corrosion resistance, yet is very economical and does not require an additional aluminizing process. On the other hand, Rickerby suggests the use of significantly more platinum, and apparently did not recognize that good oxidation and corrosion resistance can be achieved more economically with a lower integrated content of platinum. Thus, in comparison to the teachings of Rickerby et al., it was unexpected and surprising that the invention could achieve such good results with a lower amount of platinum. There also would have been no suggestion, or common sense, or predictable modification of the Rickerby disclosures, in a manner toward achieving the present invention with any reasonable expectation of success. A person of ordinary skill would not have recognized the present inventive benefits, much less how to achieve them.

For these reasons, the present invention would not have been obvious, and the Examiner is respectfully requested to withdraw the obviousness rejection applying Rickerby et al.

- 7) Favorable reconsideration and allowance of the application, including all present claims 40 to 61, are respectfully requested.

Respectfully submitted,

WFF:he/4938
Enclosures:
Transmittal Cover Sheet
Term Extension Request
Form PTO-2038

By Walter F. Fasse
Walter F. Fasse
Patent Attorney
Reg. No.: 36132
Tel. 207-862-4671
Fax. 207-862-4681
P. O. Box 726
Hampden, ME 04444-0726

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Walter F. Fasse 10/24/08
Name: Walter F. Fasse - Date: October 24, 2008